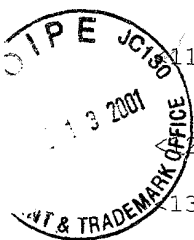


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<110> Peak, Ian  
Jennings, Michael

<120> MODIFIED SURFACE ANTIGEN

<130> 8795-24U1

<140> US 09/771,382

<141> 2001-01-25

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<151> 2000-01-25

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Thr Val Lys Thr Ala Val Leu Ala Thr Leu Leu Phe Ala Thr Val Gln  
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Ala Ser Ala Asn Asn Glu Glu Gln Glu Glu Asp Leu Tyr Leu Asp Pro  
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Val Gln Arg Thr Val Ala Val Leu Ile Val Asn Ser Asp Lys Glu Gly  
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Thr Gly Glu Lys Glu Lys Val Glu Glu Asn Ser Asp Trp Ala Val Tyr  
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Phe Asn Glu Lys Gly Val Leu Thr Ala Arg Glu Ile Thr Leu Lys Ala  
100 105 110

Gly Asp Asn Leu Lys Ile Lys Gln Asn Gly Thr Asn Phe Thr Tyr Ser  
115 120 125

Leu Lys Lys Asp Leu Thr Asp Leu Thr Ser Val Gly Thr Glu Lys Leu  
130 135 140

Ser Phe Ser Ala Asn Gly Asn Lys Val Asn Ile Thr Ser Asp Thr Lys  
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Gly Leu Asn Phe Ala Lys Glu Thr Ala Gly Thr Asn Gly Asp Thr Thr



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Ala Gln Leu Lys	Gly Val Ala Gln Asn Leu Asn Asn Arg Ile Asp Asn	500											505						510	
Val Asp Gly Asn	Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala Thr Ala	515											520						525	
Gly Leu Val Gln	Ala Tyr Leu Pro Gly Lys Ser Met Met Ala Ile Gly	530											535						540	
Gly Gly Thr Tyr	Arg Gly Glu Ala Gly Tyr Ala Ile Gly Tyr Ser Ser	545											550						555	
Ile Ser Asp Gly	Gly Asn Trp Ile Ile Lys Gly Thr Ala Ser Gly Asn	565											570						575	
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Thr Val Lys Thr Ala Val Leu Ala Thr Leu Leu Phe Ala Thr Val Gln	35 40 45																			
Ala Asn Ala Thr Asp Glu Asp Glu Glu Glu Glu Leu Glu Ser Val Gln	50 55 60																			
Arg Ser Val Val Gly Ser Ile Gln Ala Ser Met Glu Gly Ser Val Glu	65 70 75 80																			
Leu Glu Thr Ile Ser Leu Ser Met Thr Asn Asp Ser Lys Glu Phe Val	85 90 95																			
Asp Pro Tyr Ile Val Val Thr Leu Lys Ala Gly Asp Asn Leu Lys Ile	100 105 110																			
Lys Gln Asn Thr Asn Glu Asn Thr Asn Ala Ser Ser Phe Thr Tyr Ser	115 120 125																			
Leu Lys Lys Asp Leu Thr Gly Leu Ile Asn Val Glu Thr Glu Lys Leu	130 135 140																			

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Gly	Trp	Arg	Met	Lys	Thr	Thr	Thr	Ala	Asn	Gly	Gln	Thr	Gly	Gln	Ala	
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Ser	Gly	Lys	Val	Ile	Ser	Gly	Asn	Val	Ser	Pro	Ser	Lys	Gly	Lys	Met	
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Asp	Glu	Thr	Val	Asn	Ile	Asn	Ala	Gly	Asn	Asn	Ile	Glu	Ile	Thr	Arg	
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Asn Ile Asp Ile Ala Thr Ser Met Thr Pro Gln Phe Ser Ser Val Ser  
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Leu Gly Ala Gly Ala Asp Ala Pro Thr Leu Ser Val Asp Asp Glu Gly  
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Ala Leu Asn Val Gly Ser Lys Asp Ala Asn Lys Pro Val Arg Ile Thr  
 465 470 475 480

Asn Val Ala Pro Gly Val Lys Glu Gly Asp Val Thr Asn Val Ala Gln  
 485 490 495

Leu Lys Gly Val Ala Gln Asn Leu Asn Asn Arg Ile Asp Asn Val Asn  
 500 505 510

Gly Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala Thr Ala Gly Leu  
 515 520 525

Ala Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala Ile Gly Gly Gly  
 530 535 540

Thr Tyr Leu Gly Glu Ala Gly Tyr Ala Ile Gly Tyr Ser Ser Ile Ser  
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Thr Val Ala Thr Ala Val Leu Ala Thr Leu Leu Phe Ala Thr Val Gln  
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Ala Ser Thr Thr Asp Asp Asp Asp Leu Tyr Leu Glu Pro Val Gln Arg  
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Thr Ala Val Val Leu Ser Phe Arg Ser Asp Lys Glu Gly Thr Gly Glu  
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Lys Glu Val Thr Glu Asp Ser Asn Trp Gly Val Tyr Phe Asp Lys Lys  
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Gly Val Leu Thr Ala Gly Thr Ile Thr Leu Lys Ala Gly Asp Asn Leu







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Gly	Asp	Asn 115	Leu	Lys	Ile	Lys	Gln 120	Asn	Gly	Thr	Asn 125	Phe	Thr	Tyr	Ser
Leu	Lys 130	Lys	Asp	Leu	Thr	Asp 135	Leu	Thr	Ser	Val	Gly 140	Thr	Glu	Lys	Leu
Ser 145	Phe	Ser	Ala	Asn	Gly 150	Asn	Lys	Val	Asn 155	Ile	Thr	Ser	Asp	Thr 160	Lys
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Val	His	Leu	Asn 180	Gly	Ile	Gly	Ser	Thr 185	Leu	Thr	Asp	Thr 190	Leu	Leu	Asn
Thr	Gly	Ala 195	Thr	Thr	Asn	Val	Thr 200	Asn	Asp	Asn	Val 205	Thr	Asp	Asp	Glu
Lys	Lys 210	Arg	Ala	Ala	Ser	Val 215	Lys	Asp	Val	Leu	Asn 220	Ala	Gly	Trp	Asn
Ile 225	Lys	Gly	Val	Lys	Pro 230	Gly	Thr	Thr	Ala	Ser 235	Asp	Asn	Val	Asp	Phe 240
Val	Arg	Thr	Tyr	Asp 245	Thr	Val	Glu	Phe	Leu 250	Ser	Ala	Asp	Thr 255	Lys	Thr
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Val 290	Thr	Gly	Lys	Asp	Lys	Gly 295	Glu	Asn	Gly	Ser	Ser 300	Thr	Asp	Glu	Gly
Glu 305	Gly	Leu	Val	Thr	Ala 310	Lys	Glu	Val	Ile	Asp 315	Ala	Val	Asn	Lys	Ala 320
Gly	Trp	Arg	Met	Lys 325	Thr	Thr	Thr	Ala	Asn 330	Gly	Gln	Thr	Gly	Gln 335	Ala
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Ser Val Ser Leu Gly Ala Gly Ala Asp Ala Pro Thr Leu Ser Val Asp  
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Gly Asp Ala Leu Asn Val Gly Ser Lys Lys Asp Asn Lys Pro Val Arg  
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Ile Thr Asn Val Ala Pro Gly Val Lys Glu Gly Asp Val Thr Asn Val  
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Ala Gln Leu Lys Gly Val Ala Gln Asn Leu Asn Asn Arg Ile Asp Asn  
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Gly Gly Thr Tyr Arg Gly Glu Ala Gly Tyr Ala Ile Gly Tyr Ser Ser  
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Thr Val Lys Thr Ala Val Leu Ala Thr Leu Leu Phe Ala Thr Val Gln  
 35 40 45

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Ser 145	Val	Glu	Thr	Glu	Lys 150	Leu	Ser	Phe	Gly	Ala 155	Asn	Gly	Asn	Lys	Val 160
Asn	Ile	Thr	Ser	Asp 165	Thr	Lys	Gly	Leu	Asn 170	Phe	Ala	Lys	Glu	Thr 175	Ala
Gly	Thr	Asn	Gly 180	Asp	Thr	Thr	Val	His 185	Leu	Asn	Gly	Ile	Gly 190	Ser	Thr
Leu	Thr 195	Asp	Thr	Leu	Leu	Asn	Thr 200	Gly	Ala	Thr	Thr	Asn 205	Val	Thr	Asn
Asp	Asn 210	Val	Thr	Asp	Asp	Lys 215	Lys	Lys	Arg	Ala	Ala 220	Ser	Val	Lys	Asp
Val 225	Leu	Asn	Ala	Gly	Trp 230	Asn	Ile	Lys	Gly	Val 235	Lys	Pro	Gly	Thr	Thr 240
Ala	Ser	Asp	Asn	Val 245	Asp	Phe	Val	His	Thr 250	Tyr	Asp	Thr	Val	Glu 255	Phe
Leu	Ser	Ala	Asp 260	Thr	Lys	Thr	Thr 265	Thr	Val	Asn	Val	Glu	Ser 270	Lys	Asp
Asn	Gly 275	Lys	Arg	Thr	Glu	Val	Lys 280	Ile	Gly	Ala	Lys	Thr 285	Ser	Val	Ile
Lys	Glu 290	Lys	Asp	Gly	Lys	Leu 295	Val	Thr	Gly	Lys	Gly 300	Lys	Gly	Glu	Asn
Gly 305	Ser	Ser	Thr	Asp	Glu 310	Gly	Glu	Gly	Leu	Val 315	Thr	Ala	Lys	Glu	Val 320
Ile	Asp	Ala	Val	Asn 325	Lys	Ala	Gly	Trp	Arg 330	Met	Lys	Thr	Thr	Thr 335	Ala
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Thr	Val	Ala	Thr	Ala	Val	Leu	Ala	Thr	Leu	Leu	Phe	Ala	Thr	Val	Gln				
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Ala	Asn	Ala	Thr	Asp	Asp	Asp	Asp	Leu	Tyr	Leu	Glu	Pro	Val	Gln	Arg				
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Arg	Val	Leu	Lys	Ala	Gly	Ala	Ile	Thr	Leu	Lys	Ala	Gly	Asp	Asn	Leu				
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			180						185						190				
Thr	Asp	Thr	Leu	Leu	Asn	Thr	Gly	Ala	Thr	Thr	Asn	Val	Thr	Asn	Asp				
			195			200						205							
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Leu	Asn	Ala	Gly	Trp	Asn	Ile	Lys	Gly	Val	Lys	Pro	Gly	Thr	Thr	Ala				
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Ser	Asp	Asn	Val	Asp	Phe	Val	Arg	Thr	Tyr	Asp	Thr	Val	Glu	Phe	Leu				
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Ser	Ala	Asp	Thr	Lys	Thr	Thr	Thr	Val	Asn	Val	Glu	Ser	Lys	Asp	Asn				
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Glu	Lys	Asp	Gly	Lys	Leu	Val	Thr	Gly	Lys	Gly	Lys	Asp	Glu	Asn	Gly				
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Lys Val Thr Phe Ala Ser Gly Asn Gly Thr Thr Ala Thr Val Ser Lys						
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Asp Asp Gln Gly Asn Ile Thr Val Lys Tyr Asp Val Asn Val Gly Asp						
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Ala Leu Asn Val Asn Gln Leu Gln Asn Ser Gly Trp Asn Leu Asp Ser						
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Lys Ala Val Ala Gly Ser Ser Gly Lys Val Ile Ser Gly Asn Val Ser						
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Pro Ser Lys Gly Lys Met Asp Glu Thr Val Asn Ile Asn Ala Gly Asn						
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Asn Ile Glu Ile Thr Arg Asn Gly Lys Asn Ile Asp Ile Ala Thr Ser						
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Met Thr Pro Gln Phe Ser Ser Val Ser Leu Gly Ala Gly Ala Asp Ala						
	450			455		460
Pro Thr Leu Ser Val Asp Asp Glu Gly Ala Leu Asn Val Gly Ser Lys						
	465			470		475
Asp Ala Asn Lys Pro Val Arg Ile Thr Asn Val Ala Pro Gly Val Lys						
	485			490		495
Glu Gly Asp Val Thr Asn Val Ala Gln Leu Lys Gly Val Ala Gln Asn						
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Leu Asn Asn Arg Ile Asp Asn Val Asp Gly Asn Ala Arg Ala Gly Ile						
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Ala Gln Ala Ile Ala Thr Ala Gly Leu Ala Gln Ala Tyr Leu Pro Gly						
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Lys Ser Met Met Ala Ile Gly Gly Gly Thr Tyr Arg Gly Glu Ala Gly						
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Tyr Ala Ile Gly Tyr Ser Ser Ile Ser Asp Thr Gly Asn Trp Val Ile						
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Ala Asn Ala Thr Asp Asp Asp Asp Leu Tyr Leu Glu Pro Val Gln Arg
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Thr Ala Val Val Leu Ser Phe Arg Ser Asp Lys Glu Gly Thr Gly Glu
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Lys Glu Gly Thr Glu Asp Ser Asn Trp Ala Val Tyr Phe Asp Glu Lys
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Arg Val Leu Lys Ala Gly Ala Ile Thr Leu Lys Ala Gly Asp Asn Leu
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Lys Ile Lys Gln Asn Thr Asn Glu Asn Thr Asn Glu Asn Thr Asn Asp
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Ser Ser Phe Thr Tyr Ser Leu Lys Lys Asp Leu Thr Asp Leu Thr Ser
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Val Glu Thr Glu Lys Leu Ser Phe Gly Ala Asn Gly Asn Lys Val Asn
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Ile Thr Ser Asp Thr Lys Gly Leu Asn Phe Ala Lys Glu Thr Ala Gly
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Thr Asn Gly Asp Pro Thr Val His Leu Asn Gly Ile Gly Ser Thr Leu
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Thr Asp Thr Leu Leu Asn Thr Gly Ala Thr Thr Asn Val Thr Asn Asp
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Asn Val Thr Asp Asp Glu Lys Lys Arg Ala Ala Ser Val Lys Asp Val
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Leu Asn Ala Gly Trp Asn Ile Lys Gly Val Lys Pro Gly Thr Thr Ala
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Ser Asp Asn Val Asp Phe Val Arg Thr Tyr Asp Thr Val Glu Phe Leu
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Ser Ala Asp Thr Lys Thr Thr Thr Val Asn Val Glu Ser Lys Asp Asn
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 325 330 335  
 Gly Gln Thr Gly Gln Ala Asp Lys Phe Glu Thr Val Thr Ser Gly Thr  
 340 345 350  
 Lys Val Thr Phe Ala Ser Gly Asn Gly Thr Thr Ala Thr Val Ser Lys  
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 Asp Asp Gln Gly Asn Ile Thr Val Lys Tyr Asp Val Asn Val Gly Asp  
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Ala Asn Ala Thr Asp Asp Asp Asp Leu Tyr Leu Glu Pro Val Gln Arg  
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Thr Ala Val Val Leu Ser Phe Arg Ser Asp Lys Glu Gly Thr Gly Glu  
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Lys Glu Gly Thr Glu Asp Ser Asn Trp Ala Val Tyr Phe Asp Glu Lys  
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Arg Val Leu Lys Ala Gly Ala Ile Thr Leu Lys Ala Gly Asp Asn Leu  
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Lys Ile Lys Gln Asn Thr Asn Glu Asn Thr Asn Asp Ser Ser Phe Thr  
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Tyr Ser Leu Lys Lys Asp Leu Thr Asp Leu Thr Ser Val Glu Thr Glu  
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Lys Leu Ser Phe Gly Ala Asn Gly Asn Lys Val Asn Ile Thr Ser Asp  
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Thr Lys Gly Leu Asn Phe Ala Lys Glu Thr Ala Gly Thr Asn Gly Asp  
 165 170 175

Pro Thr Val His Leu Asn Gly Ile Gly Ser Thr Leu Thr Asp Thr Leu  
 180 185 190

Leu Asn Thr Gly Ala Thr Thr Asn Val Thr Asn Asp Asn Val Thr Asp  
 195 200 205

Asp Glu Lys Lys Arg Ala Ala Ser Val Lys Asp Val Leu Asn Ala Gly  
 210 215 220

Trp Asn Ile Lys Gly Val Lys Pro Gly Thr Thr Ala Ser Asp Asn Val  
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Glu	Val	Lys	Ile	Gly	Ala	Lys	Thr	Ser	Val	Ile	Lys	Glu	Lys	Asp	Gly	275	280	285
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Glu	Gly	Glu	Gly	Leu	Val	Thr	Ala	Lys	Glu	Val	Ile	Asp	Ala	Val	Asn	305	310	315
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Ala	Ser	Gly	Lys	Gly	Thr	Thr	Ala	Thr	Val	Ser	Lys	Asp	Asp	Gln	Gly	355	360	365
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Asn	Gln	Leu	Gln	Asn	Ser	Gly	Trp	Asn	Leu	Asp	Ser	Lys	Ala	Val	Ala	385	390	395
Gly	Ser	Ser	Gly	Lys	Val	Ile	Ser	Gly	Asn	Val	Ser	Pro	Ser	Lys	Gly	405	410	415
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Pro	Val	Arg	Ile	Thr	Asn	Val	Ala	Pro	Gly	Val	Lys	Glu	Gly	Asp	Val	485	490	495
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Ile	Asp	Asn	Val	Asp	Gly	Asn	Ala	Arg	Ala	Gly	Ile	Ala	Gln	Ala	Ile	515	520	525
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Gln Trp

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<213> Neisseria meningitidis

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Lys Gln Asn Thr Asn Glu Asn Thr Asn Ala Ser Ser Phe Thr Tyr Ser  
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<212> DNA
<213> Neisseria meningitidis

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gcttcgata acgttgatgt cgtccacact tacgacacag tcgagttctt gagcgagat 780
acgaaaacaa cgactgttaa tgtggaaagc aaagacaacg gcaagagaac cgaagttaaa 840

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cccacggttc atctgaacgg tatcggttcg actttgaccg atacgctgct gaataccgga 600  
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<210> 19  
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<212> DNA  
<213> Neisseria meningitidis

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aactgttgt ttgcaacggc tcaggcgaat gctaccgatg acgacgattt atatttagaa 180  
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gatctgacca gtgttgaaac tgaaaaatta tcgtttggcg caaacggtaa taaagtcaac 480  
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<212> DNA  
<213> Neisseria meningitidis

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<212> DNA  
<213> Neisseria meningitidis

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Asn	Thr	Gly	Ala	Thr	Thr	Asn	Val	Thr	Asn	Asp	Asn	Val	Thr	Asp	Asp	
		115					120					125				
Glu	Lys	Lys	Arg	Ala	Ala	Ser	Val	Lys	Asp	Val	Leu	Asn	Ala	Gly	Trp	
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145					150					155					160	
Phe	Val	Arg	Thr	Tyr	Asp	Thr	Val	Glu	Phe	Leu	Ser	Ala	Asp	Thr	Lys	
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Ala	Gly	Trp	Arg	Met	Lys	Thr	Thr	Thr	Ala	Asn	Gly	Gln	Thr	Gly	Gln	
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			260					265					270			
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Ser	Ser	Gly	Lys	Val	Ile	Ser	Gly	Asn	Val	Ser	Pro	Ser	Lys	Gly	Lys	
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			340					345					350			
Arg	Asn	Gly	Lys	Asn	Ile	Asp	Ile	Ala	Thr	Ser	Met	Thr	Pro	Gln	Phe	
		355					360					365				
Ser	Ser	Val	Ser	Leu	Gly	Ala	Gly	Ala	Asp	Ala	Pro	Thr	Leu	Ser	Val	
		370					375					380				
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Arg Ile Thr Asn Val Ala Pro Gly Val Lys Glu Gly Asp Val Thr Asn  
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Val Ala Gln Leu Lys Gly Val Ala Gln Asn Leu Asn Asn Arg Ile Asp  
420 425 430

Asn Val Asp Gly Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala Thr  
435 440 445

Ala Gly Leu Val Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala Ile  
450 455 460

Gly Gly Gly Thr Tyr Arg Gly Glu Ala Gly Tyr Ala Ile Gly Tyr Ser  
465 470 475 480

Ser Ile Ser Asp Gly Gly Asn Trp Ile Ile Lys Gly Thr Ala Ser Gly  
485 490 495

Asn Ser Arg Gly His Phe Gly Ala Ser Ala Ser Val Gly Tyr Gln Trp  
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<210> 24  
<211> 513  
<212> PRT  
<213> Neisseria meningitidis

<400> 24

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Thr Val Lys Thr Ala Val Leu Ala Thr Leu Leu Phe Ala Thr Val Gln  
35 40 45

Ala Asn Ala Thr Asp Glu Thr Gly Leu Ile Asn Val Glu Thr Glu Lys  
50 55 60

Leu Ser Phe Gly Ala Asn Gly Lys Lys Val Asn Ile Ile Ser Asp Thr  
65 70 75 80

Lys Gly Leu Asn Phe Ala Lys Glu Thr Ala Gly Thr Asn Gly Asp Thr  
85 90 95

Thr Val His Leu Asn Gly Ile Gly Ser Thr Leu Thr Asp Met Leu Leu  
100 105 110

Asn Thr Gly Ala Thr Thr Asn Val Thr Asn Asp Asn Val Thr Asp Asp  
115 120 125

Glu Lys Lys Arg Ala Ala Ser Val Lys Asp Val Leu Asn Ala Gly Trp  
130 135 140

Asn Ile Lys Gly Val Lys Pro Gly Thr Thr Ala Ser Asp Asn Val Asp  
 145 150 155 160  
 Phe Val Arg Thr Tyr Asp Thr Val Glu Phe Leu Ser Ala Asp Thr Lys  
 165 170 175  
 Thr Thr Thr Val Asn Val Glu Ser Lys Asp Asn Gly Lys Lys Thr Glu  
 180 185 190  
 Val Lys Ile Gly Ala Lys Thr Ser Val Ile Lys Glu Lys Asp Gly Lys  
 195 200 205  
 Leu Val Thr Gly Lys Gly Lys Gly Glu Asn Gly Ser Ser Thr Asp Glu  
 210 215 220  
 Gly Glu Gly Leu Val Thr Ala Lys Glu Val Ile Asp Ala Val Asn Lys  
 225 230 235 240  
 Ala Gly Trp Arg Met Lys Thr Thr Thr Ala Asn Gly Gln Thr Gly Gln  
 245 250 255  
 Ala Asp Lys Phe Glu Thr Val Thr Ser Gly Thr Lys Val Thr Phe Ala  
 260 265 270  
 Ser Gly Asn Gly Thr Thr Ala Thr Val Ser Lys Asp Asp Gln Gly Asn  
 275 280 285  
 Ile Thr Val Lys Tyr Asp Val Asn Val Gly Asp Ala Leu Asn Val Asn  
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 Gln Leu Gln Asn Ser Gly Trp Asn Leu Asp Ser Lys Ala Val Ala Gly  
 305 310 315 320  
 Ser Ser Gly Lys Val Ile Ser Gly Asn Val Ser Pro Ser Lys Gly Lys  
 325 330 335  
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 Arg Asn Gly Lys Asn Ile Asp Ile Ala Thr Ser Met Thr Pro Gln Phe  
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 370 375 380  
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 385 390 395 400  
 Val Arg Ile Thr Asn Val Ala Pro Gly Val Lys Glu Gly Asp Val Thr  
 405 410 415  
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 435 440 445



Thr Ala Gly Leu Val Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala  
450 455 460

Ile Gly Gly Gly Thr Tyr Leu Gly Glu Ala Gly Tyr Ala Ile Gly Tyr  
465 470 475 480

Ser Ser Ile Ser Ala Gly Gly Asn Trp Ile Ile Lys Gly Thr Ala Ser  
485 490 495

Gly Asn Ser Arg Gly His Phe Gly Ala Ser Ala Ser Val Gly Tyr Gln  
500 505 510

Trp

<210> 25

<211> 407

<212> PRT

<213> Neisseria meningitidis

<400> 25

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Thr Val Lys Thr Ala Val Leu Ala Thr Leu Leu Phe Ala Thr Val Gln  
35 40 45

Ala Ser Ala Asn Asn Val Asp Phe Val Arg Thr Tyr Asp Thr Val Glu  
50 55 60

Phe Leu Ser Ala Asp Thr Lys Thr Thr Thr Val Asn Val Glu Ser Lys  
65 70 75 80

Asp Asn Gly Lys Lys Thr Glu Val Lys Ile Gly Ala Lys Thr Ser Val  
85 90 95

Ile Lys Glu Lys Asp Gly Lys Leu Val Thr Gly Lys Asp Lys Gly Glu  
100 105 110

Asn Gly Ser Ser Thr Asp Glu Gly Glu Gly Leu Val Thr Ala Lys Glu  
115 120 125

Val Ile Asp Ala Val Asn Lys Ala Gly Trp Arg Met Lys Thr Thr Thr  
130 135 140

Ala Asn Gly Gln Thr Gly Gln Ala Asp Lys Phe Glu Thr Val Thr Ser  
145 150 155 160

Gly Thr Asn Val Thr Phe Ala Ser Gly Lys Gly Thr Thr Ala Thr Val  
165 170 175

Ser Lys Asp Asp Gln Gly Asn Ile Thr Val Met Tyr Asp Val Asn Val  
180 185 190

1  
2  
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Gly Asp Ala Leu Asn Val Asn Gln Leu Gln Asn Ser Gly Trp Asn Leu  
 195 200 205  
 Asp Ser Lys Ala Val Ala Gly Ser Ser Gly Lys Val Ile Ser Gly Asn  
 210 215 220  
 Val Ser Pro Ser Lys Gly Lys Met Asp Glu Thr Val Asn Ile Asn Ala  
 225 230 235 240  
 Gly Asn Asn Ile Glu Ile Thr Arg Asn Gly Lys Asn Ile Asp Ile Ala  
 245 250 255  
 Thr Ser Met Thr Pro Gln Phe Ser Ser Val Ser Leu Gly Ala Gly Ala  
 260 265 270  
 Asp Ala Pro Thr Leu Ser Val Asp Gly Asp Ala Leu Asn Val Gly Ser  
 275 280 285  
 Lys Lys Asp Asn Lys Pro Val Arg Ile Thr Asn Val Ala Pro Gly Val  
 290 295 300  
 Lys Glu Gly Asp Val Thr Asn Val Ala Gln Leu Lys Gly Val Ala Gln  
 305 310 315 320  
 Asn Leu Asn Asn Arg Ile Asp Asn Val Asp Gly Asn Ala Arg Ala Gly  
 325 330 335  
 Ile Ala Gln Ala Ile Ala Thr Ala Gly Leu Val Gln Ala Tyr Leu Pro  
 340 345 350  
 Gly Lys Ser Met Met Ala Ile Gly Gly Gly Thr Tyr Arg Gly Glu Ala  
 355 360 365  
 Gly Tyr Ala Ile Gly Tyr Ser Ser Ile Ser Asp Gly Gly Asn Trp Ile  
 370 375 380  
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 385 390 395 400  
 Ala Ser Val Gly Tyr Gln Trp  
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 <211> 433  
 <212> PRT  
 <213> Neisseria meningitidis  
  
 <400> 26

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 1 5 10 15  
 Val Val Val Ser Glu Leu Thr Arg Asn His Thr Lys Arg Ala Ser Ala  
 20 25 30  
 Thr Val Lys Thr Ala Val Leu Ala Thr Leu Leu Phe Ala Thr Val Gln

Ala	Ser	Ala	Asn	Arg	Ala	Ala	Ser	Val	Lys	Asp	Val	Leu	Asn	Ala	Gly
50						55					60				
Trp	Asn	Ile	Lys	Gly	Val	Lys	Pro	Gly	Thr	Thr	Ala	Ser	Asp	Asn	Val
65					70					75					80
Asp	Phe	Val	Arg	Thr	Tyr	Asp	Thr	Val	Glu	Phe	Leu	Ser	Ala	Asp	Thr
				85					90					95	
Lys	Thr	Thr	Thr	Val	Asn	Val	Glu	Ser	Lys	Asp	Asn	Gly	Lys	Lys	Thr
			100					105					110		
Glu	Val	Lys	Ile	Gly	Ala	Lys	Thr	Ser	Val	Ile	Lys	Glu	Lys	Asp	Gly
		115					120					125			
Lys	Leu	Val	Thr	Gly	Lys	Asp	Lys	Gly	Glu	Asn	Gly	Ser	Ser	Thr	Asp
	130					135					140				
Glu	Gly	Glu	Gly	Leu	Val	Thr	Ala	Lys	Glu	Val	Ile	Asp	Ala	Val	Asn
145					150					155					160
Lys	Ala	Gly	Trp	Arg	Met	Lys	Thr	Thr	Thr	Ala	Asn	Gly	Gln	Thr	Gly
				165					170					175	
Gln	Ala	Asp	Lys	Phe	Glu	Thr	Val	Thr	Ser	Gly	Thr	Asn	Val	Thr	Phe
			180					185					190		
Ala	Ser	Gly	Lys	Gly	Thr	Thr	Ala	Thr	Val	Ser	Lys	Asp	Asp	Gln	Gly
		195					200					205			
Asn	Ile	Thr	Val	Met	Tyr	Asp	Val	Asn	Val	Gly	Asp	Ala	Leu	Asn	Val
	210					215					220				
Asn	Gln	Leu	Gln	Asn	Ser	Gly	Trp	Asn	Leu	Asp	Ser	Lys	Ala	Val	Ala
225					230					235					240
Gly	Ser	Ser	Gly	Lys	Val	Ile	Ser	Gly	Asn	Val	Ser	Pro	Ser	Lys	Gly
			245						250					255	
Lys	Met	Asp	Glu	Thr	Val	Asn	Ile	Asn	Ala	Gly	Asn	Asn	Ile	Glu	Ile
			260					265					270		
Thr	Arg	Asn	Gly	Lys	Asn	Ile	Asp	Ile	Ala	Thr	Ser	Met	Thr	Pro	Gln
		275					280					285			
Phe	Ser	Ser	Val	Ser	Leu	Gly	Ala	Gly	Ala	Asp	Ala	Pro	Thr	Leu	Ser
		290				295					300				
Val	Asp	Gly	Asp	Ala	Leu	Asn	Val	Gly	Ser	Lys	Lys	Asp	Asn	Lys	Pro
305					310					315					320
Val	Arg	Ile	Thr	Asn	Val	Ala	Pro	Gly	Val	Lys	Glu	Gly	Asp	Val	Thr
				325					330					335	
Asn	Val	Ala	Gln	Leu	Lys	Gly	Val	Ala	Gln	Asn	Leu	Asn	Asn	Arg	Ile

340	345	350
Asp Asn Val Asp Gly Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala		
355	360	365
Thr Ala Gly Leu Val Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala		
370	375	380
Ile Gly Gly Gly Thr Tyr Arg Gly Glu Ala Gly Tyr Ala Ile Gly Tyr		
385	390	395
Ser Ser Ile Ser Asp Gly Gly Asn Trp Ile Ile Lys Gly Thr Ala Ser		
405	410	415
Gly Asn Ser Arg Gly His Phe Gly Ala Ser Ala Ser Val Gly Tyr Gln		
420	425	430

Trp

<210> 27  
 <211> 502  
 <212> PRT  
 <213> Neisseria meningitidis  
 <400> 27

Met Asn Lys Ile Tyr Arg Ile Ile Trp Asn Ser Ala Leu Asn Ala Trp		
1	5	10
Val Val Val Ser Glu Leu Thr Arg Asn His Thr Lys Arg Ala Ser Ala		
20	25	30
Thr Val Lys Thr Ala Val Leu Ala Thr Leu Leu Phe Ala Thr Val Gln		
35	40	45
Ala Ser Ala Asn Thr Leu Lys Ala Gly Asp Asn Leu Lys Ile Lys Gln		
50	55	60
Phe Thr Tyr Ser Leu Lys Lys Asp Leu Thr Asp Leu Thr Ser Val Gly		
65	70	75
Thr Glu Lys Leu Ser Phe Ser Ala Asn Gly Asn Lys Val Asn Ile Thr		
85	90	95
Ser Asp Thr Lys Gly Leu Asn Phe Ala Lys Glu Thr Ala Gly Thr Asn		
100	105	110
Gly Asp Thr Thr Val His Leu Asn Gly Ile Gly Ser Thr Leu Thr Asp		
115	120	125
Arg Ala Ala Ser Val Lys Asp Val Leu Asn Ala Gly Trp Asn Ile Lys		
130	135	140
Gly Val Lys Asn Val Asp Phe Val Arg Thr Tyr Asp Thr Val Glu Phe		
145	150	155
		160

Leu	Ser	Ala	Asp	Thr	Lys	Thr	Thr	Thr	Val	Asn	Val	Glu	Ser	Lys	Asp	
				165					170					175		
Asn	Gly	Lys	Lys	Thr	Glu	Val	Lys	Ile	Gly	Ala	Lys	Thr	Ser	Val	Ile	
				180					185					190		
Lys	Glu	Lys	Asp	Gly	Lys	Leu	Val	Thr	Gly	Lys	Asp	Lys	Gly	Glu	Asn	
				195					200					205		
Gly	Ser	Ser	Thr	Asp	Glu	Gly	Glu	Gly	Leu	Val	Thr	Ala	Lys	Glu	Val	
				210					215					220		
Ile	Asp	Ala	Val	Asn	Lys	Ala	Gly	Trp	Arg	Met	Lys	Thr	Thr	Thr	Ala	
				225					230					235		
Asn	Gly	Gln	Thr	Gly	Gln	Ala	Asp	Lys	Phe	Glu	Thr	Val	Thr	Ser	Gly	
				245					250					255		
Thr	Asn	Val	Thr	Phe	Ala	Ser	Gly	Lys	Gly	Thr	Thr	Ala	Thr	Val	Ser	
				260					265					270		
Lys	Asp	Asp	Gln	Gly	Asn	Ile	Thr	Val	Met	Tyr	Asp	Val	Asn	Val	Gly	
				275					280					285		
Asp	Ala	Leu	Asn	Val	Asn	Gln	Leu	Gln	Asn	Ser	Gly	Trp	Asn	Leu	Asp	
				290					295					300		
Ser	Lys	Ala	Val	Ala	Gly	Ser	Ser	Gly	Lys	Val	Ile	Ser	Gly	Asn	Val	
				305					310					315		
Ser	Pro	Ser	Lys	Gly	Lys	Met	Asp	Glu	Thr	Val	Asn	Ile	Asn	Ala	Gly	
				325					330					335		
Asn	Asn	Ile	Glu	Ile	Thr	Arg	Asn	Gly	Lys	Asn	Ile	Asp	Ile	Ala	Thr	
				340					345					350		
Ser	Met	Thr	Pro	Gln	Phe	Ser	Ser	Val	Ser	Leu	Gly	Ala	Gly	Ala	Asp	
				355					360					365		
Ala	Pro	Thr	Leu	Ser	Val	Asp	Gly	Asp	Ala	Leu	Asn	Val	Gly	Ser	Lys	
				370					375					380		
Lys	Asp	Asn	Lys	Pro	Val	Arg	Ile	Thr	Asn	Val	Ala	Pro	Gly	Val	Lys	
				385					390					395		
Glu	Gly	Asp	Val	Thr	Asn	Val	Ala	Gln	Leu	Lys	Gly	Val	Ala	Gln	Asn	
				405					410					415		
Leu	Asn	Asn	Arg	Ile	Asp	Asn	Val	Asp	Gly	Asn	Ala	Arg	Ala	Gly	Ile	
				420					425					430		
Ala	Gln	Ala	Ile	Ala	Thr	Ala	Gly	Leu	Val	Gln	Ala	Tyr	Leu	Pro	Gly	
				435					440					445		
Lys	Ser	Met	Met	Ala	Ile	Gly	Gly	Gly	Thr	Tyr	Arg	Gly	Glu	Ala	Gly	
				450					455					460		

Tyr Ala Ile Gly Tyr Ser Ser Ile Ser Asp Gly Gly Asn Trp Ile Ile  
 465 470 475 480

Lys Gly Thr Ala Ser Gly Asn Ser Arg Gly His Phe Gly Ala Ser Ala  
 485 490 495

Ser Val Gly Tyr Gln Trp  
 500

<210> 28  
 <211> 1539  
 <212> DNA  
 <213> Neisseria meningitidis

<400> 28  
 atgaacaaaa tataaccgcat catttggaat agtgccctca atgcatgggt cgtcgtatcc 60  
 gagctcacac gcaaccacac caaacgcgcc tccgcaaccg tgaagaccgc cgtattggcg 120  
 actctgttgt ttgcaacgggt tcaggcaagt gctaacaatg aaacagatct gaccagtgtt 180  
 ggaactgaaa aattatcggt tagcgcaaac ggcaataaag tcaacatcac aagcgacacc 240  
 aaaggcttga attttgcgaa agaaacggct gggacgaacg gcgacaccac ggttcatctg 300  
 aacggtattg gttcgacttt gaccgatacg ctgctgaata ccggagcgac cacaaacgta 360  
 accaacgaca acgttaccga tgacgagaaa aaacgtgcgg caagcgtaa agacgtatta 420  
 aacgctgggt ggaacattaa aggcgttaaa cccggtacaa cagcttccga taacgttgat 480  
 ttcgtccgca cttacgacac agtcgagttc ttgagcgcag atacgaaaac aacgactgtt 540  
 aatgtggaag gcaaagacaa cggcaagaaa accgaagtta aaatcgggtgc gaagacttct 600  
 gttattaaag aaaaagacgg taagttgggt actggttaaag acaaaggcga gaatggttct 660  
 tctacagacg aaggcgaagg cttagtgact gcaaaagaag tgattgatgc agtaaacaag 720  
 gctggttga gaagtaaaac aacaaccgct aatgggtcaaa cagggtcaagc tgacaagttt 780  
 gaaaccgtta catcaggcac aaatgtaacc tttgctagtg gtaaaggtag aactgcgact 840  
 gtaagtaaag atgatcaagg caacatcact gttatgtatg atgtaaatgt cggcgatgcc 900  
 ctaaacgtca atcagctgca aaacagcgggt tggaatttgg attccaaagc ggttgcaggt 960  
 tcttcgggca aagtcacag cggcaatgtt tcgccgagca agggaaagat ggatgaaacc 1020  
 gtcaacatta atgccggcaa caacatcgag attaccgcga acggtaaaaa tatcgacatc 1080  
 gccacttoga tgaccccgca gttttccagc gtttcgctcg gcgcgggggc ggatgcgccc 1140  
 actttgagcg tggatgggga cgcattgaat gtcggcagca agaaggacaa caaaccgcgc 1200  
 cgcattacca atgtcgcccc gggcggttaa gagggggatg ttacaaacgt cgcacaactt 1260

aaaggcgtgg cgcaaaactt gaacaaccgc atcgacaatg tggacggcaa cgcgcggtgcg 1320  
 ggcatcgccc aagcgattgc aaccgcaggt ctggttcagg cgtatttggc cggaagagt 1380  
 atgatggcga tggcgggcgg cacttatcgc gggaagccg gttacgccat cggtactcc 1440  
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<210> 29  
 <211> 1542  
 <212> DNA  
 <213> Neisseria meningitidis

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 aactgttgt ttgcaacggt tcaggcgaat gctaccgatg aaacaggcct gatcaatgtt 180  
 gaaactgaaa aattatcggt tggcgcaaac ggcaagaaag tcaacatcat aagcgacacc 240  
 aaaggcttga atttcgcgaa agaaacggct gggacgaacg gcgacaccac ggttcatctg 300  
 aacggtatcg gttcgacttt gaccgatatg ctgctgaata ccggagcgac cacaacgta 360  
 accaacgaca acgttacga tgacgagaaa aaacgtgcgg caagcggtta agacgtatta 420  
 aacgcaggct ggaacattaa aggcgttaaa cccgggtaca cagcttccga taacgttgat 480  
 ttcgtccgca cttacgacac agtcgagttc ttgagcgag atacgaaaac aacgactgtt 540  
 aatgtgaaa gcaaagacaa cggcaagaaa accgaagtta aaatcggtgc gaagacttct 600  
 gttattaaag aaaaagacgg taagttggtt actggtaaag gcaaaggcga gaatggttct 660  
 tctacagacg aaggcgaagg cttagtact gcaaaagaag tgattgatgc agtaacaag 720  
 gctggttga gaatgaaaac aacaaccgct aatggtcaaa cagggtcaagc tgacaagttt 780  
 gaaaccgtta catcaggcac aaaagtaacc tttgctagt gtaatggtac aactgcgact 840  
 gtaagtaaag atgatcaagg caacatcact gtttaagtatg atgtaaatgt cggcgatgcc 900  
 ctaaacgtca atcagctgca aaacagcggg ttgaatttg attccaaagc ggttgcagg 960  
 tcttcgggca aagtcacag cggcaatgtt tcgccgagca agggaaagat ggatgaaacc 1020  
 gtcaacatta atgcgggcaa caacatcgag attaccgcga acggcaaaaa tatcgacac 1080  
 gccacttoga tgaccccgca attttccagc gtttcgctcg gcgcgggggc ggatgcgccc 1140  
 actttaagcg tggatgacga gggcggttg aatgtcggca gcaaggatgc caacaaacc 1200

gtccgcatta ccaatgtcgc cccgggogtt aaagaggggg atgttacaaa cgtcgcgcaa 1260  
 cttaaagggtg tggcgcaaaa cttgaacaac cgcacgcaca atgtgaacgg caacgcgcgt 1320  
 gcgggcatcg cccaagcgat tgcaaccgca ggtctggttc aggcgtatct gcccggaag 1380  
 agtatgatgg cgatcggcgg cggcacttat ctcggcgaag ccggttatgc catcggctac 1440  
 tcaagcattt ccgccggcgg aaattggatt atcaaaggca cggcttcgg caattcgcgc 1500  
 ggccatttcg gtgcttcgc atctgtcgg tatcagtgg aa 1542

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 <211> 1224  
 <212> DNA  
 <213> Neisseria meningitidis

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 actctgttgt ttgcaacggc tcaggcaagt gctaacaacg ttgatttcgt ccgcacttac 180  
 gacacagtcg agttcttgag cgcagatacg aaaacaacga ctgttaatgt ggaaagcaaa 240  
 gacaacggca agaaaaccga agttaaaatc ggtgcgaaga cttctgttat taaagaaaaa 300  
 gacggtaagt tggttactgg taaagacaaa ggcgagaatg gttcttctac agacgaaggc 360  
 gaaggcttag tgactgcaaa agaagtgatt gatgcagtaa acaaggctgg ttggagaatg 420  
 aaaacaacaa ccgctaattg tcaaacaggc caagctgaca agtttgaaac cgttacatca 480  
 ggcacaaatg taacctttgc tagtggtaaa ggtacaactg cgactgtaag taaagatgat 540  
 caaggcaaca tcaactgttat gtatgatgta aatgtcggcg atgccctaaa cgtcaatcag 600  
 ctgcaaaaaca gcggttgaa tttggattcc aaagcggttg caggttcttc gggcaaagtc 660  
 atcagcggca atgtttcgcc gagcaaggga aagatggatg aaaccgtcaa cattaatgcc 720  
 ggcaacaaca tcgagattac ccgcaacggc aaaaatatcg acatcgccac ttcgatgacc 780  
 ccgcagtttt ccagcgtttc gctcggcgcg ggggcggatg cggccacttt gagcgtggat 840  
 ggggacgcat tgaatgtcgg cagcaagaag gacaacaaac ccgtccgcat taccaatgtc 900  
 gccccgggcg ttaaagaggg ggatgttaca aacgtcgcac aacttaaagg cgtggcgcaa 960  
 aacttgaaca accgcacoga caatgtggac ggcaacgcgc gtgcgggcat cggccaagcg 1020  
 attgcaaccg caggctctgt tcaggcgtat ttgcccggca agagtatgat ggcgatcggc 1080  
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<211> 1509  
 <212> DNA  
 <213> Neisseria meningitidis

<400> 32

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actctgttgt ttgcaacggg tcaggcaagt gctaacaccc tcaaagccgg cgacaacctg	180
aaaatcaaac aattcaccta ctcgctgaaa aaagacctca cagatctgac cagtgttga	240
actgaaaaat tatcgtttag cgcaaacggc aataaagtca acatcacaag cgacacccaa	300
ggcttgaatt ttgcgaaaga aacggctggg acgaacggcg acaccacggg tcatctgaac	360
ggtattgggt cgactttgac cgatcgtagc gcaagcgta aagacgtatt aaacgctggc	420
tggaacatta aaggcgtaa aaacgttgat ttcgtccgca cttacgacac agtcgagttc	480
ttgagcgcag atacgaaaac aacgactgtt aatgtggaaa gcaaagacaa cggcaagaaa	540
accgaagtta aaatcggtag gaagacttct gttattaaag aaaaagacgg taagttgggt	600
actggtaaag acaaaggcga gaatggttct tctacagacg aaggcgaagg cttagtgaat	660
gcaaaagaag tgattgatgc agtaacaag gctggttga gaatgaaaac aacaaccgct	720
aatgggtcaa caggtcaagc tgacaagttt gaaaccgtta catcaggcac aaatgtaacc	780
tttgctagtg gtaaaggtac aactgcgact gtaagtaaag atgatcaagg caacatcact	840
gttatgtatg atgtaaatgt cggcgatgcc ctaaacgtca atcagctgca aaacagcggg	900
tggaatttgg attccaaagc ggttgcaggg tcttcgggca aagtcacag cggcaatgtt	960
tcgccgagca agggaaagat ggatgaaacc gtcaacatta atgccggcaa caacatcgag	1020
attacccgca acggtaaaaa tatcgacatc gccacttoga tgaccccgca gttttccagc	1080
gtttcgctcg gcgcgggggc ggatgcgccc actttgagcg tggatgggga cgcattgaat	1140
gtcggcagca agaaggacaa caaaccgctc cgcattacca atgtcgcccc gggcggttaa	1200
gagggggatg ttacaaacgt cgcacaactt aaaggcgtgg cgcaaaactt gaacaaccgc	1260
atcgacaatg tggacggcaa cgcgcgtgag ggcacgccc aagcgattgc aaccgcaggg	1320
ctggttcagg cgtatttgcc cggcaagagt atgatggcga tcggcggcgg cacttatcgc	1380
ggcgaagccg gttacgcoat cggctactcc agtatttccg acggcggaaa ttggattatc	1440
aaaggcacgg cttccggcaa ttcgcgcggc catttcggtg cttccgcac tgctcggttat	1500
cagtggtaa	1509

<210> 33  
 <211> 540  
 <212> PRT  
 <213> Neisseria meningitidis

<400> 33

Asn Asn Glu Glu Gln Glu Glu Tyr Leu Tyr Leu His Pro Val Gln Arg  
 1 5 10 15

Thr Val Ala Val Leu Ile Val Asn Ser Asp Lys Glu Gly Ala Gly Glu  
 20 25 30

Lys Glu Lys Val Glu Glu Asn Ser Asp Trp Ala Val Tyr Phe Asn Glu  
 35 40 45

Lys Gly Val Leu Thr Ala Arg Glu Ile Thr Leu Lys Ala Gly Asp Asn  
 50 55 60

Leu Lys Ile Lys Gln Asn Gly Thr Asn Phe Thr Tyr Ser Leu Lys Lys  
 65 70 75 80

Asp Leu Thr Asp Leu Thr Ser Val Gly Thr Glu Lys Leu Ser Phe Ser  
 85 90 95

Ala His Gly Asn Lys Val Asn Ile Thr Ser Asp Thr Lys Gly Leu Asn  
 100 105 110

Phe Ala Lys Glu Thr Ala Gly Thr Asn Gly Asp Thr Thr Val His Leu  
 115 120 125

Asn Gly Ile Gly Ser Thr Leu Thr Asp Thr Leu Leu Asn Thr Gly Ala  
 130 135 140

Thr Thr Asn Val Thr Asn Asp Asn Val Thr Asp Asp Glu Lys Lys Arg  
 145 150 155 160

Ala Ala Ser Val Lys Asp Val Leu Asn Ala Gly Trp Asn Ile Lys Gly  
 165 170 175

Val Lys Pro Gly Thr Thr Ala Ser Asp Asn Val Asp Phe Val Arg Thr  
 180 185 190

Tyr Asp Thr Val Glu Phe Leu Ser Ala Asp Thr Lys Thr Thr Thr Val  
 195 200 205

Asn Val Glu Ser Lys Asp Asn Gly Lys Lys Thr Glu Val Lys Ile Gly  
 210 215 220

Ala Lys Thr Ser Val Ile Lys Glu Lys Asp Gly Lys Leu Val Thr Gly  
 225 230 235 240

Lys Asp Lys Gly Glu Asn Gly Ser Ser Thr Asp Glu Gly Glu Gly Leu  
 245 250 255

Val Thr Ala Lys Glu Val Ile Asp Ala Val Asn Lys Ala Gly Trp Arg

260	265	270
Met Lys Thr Thr Thr Ala Asn Gly Gln Thr Gly Gln Ala Asp Lys Phe 275 280 285		
Glu Thr Val Thr Ser Gly Thr Asn Val Thr Phe Ala Ser Gly Lys Gly 290 295 300		
Thr Thr Ala Thr Val Ser Lys Asp Asp Gln Gly Asn Ile Thr Val Met 305 310 315 320		
Tyr Asp Val Asn Val Gly Asp Ala Leu Asn Val Asn Gln Leu Gln Asn 325 330 335		
Ser Gly Trp Asn Leu Asp Ser Lys Ala Val Ala Gly Ser Ser Gly Lys 340 345 350		
Val Ile Ser Gly Asn Val Ser Pro Ser Lys Gly Lys Met Asp Glu Thr 355 360 365		
Val Asn Ile Asn Ala Gly Asn Asn Ile Glu Ile Thr Arg Asn Gly Lys 370 375 380		
Asn Ile Asp Ile Ala Thr Ser Met Thr Pro Gln Phe Ser Ser Val Ser 385 390 395 400		
Leu Gly Ala Gly Ala Asp Ala Pro Thr Leu Ser Val Asp Gly Asp Ala 405 410 415		
Leu Asn Val Gly Ser Lys Lys Asp Asn Lys Pro Val Arg Ile Thr Asn 420 425 430		
Val Ala Pro Gly Val Lys Glu Gly Asp Val Thr Asn Val Ala Gln Leu 435 440 445		
Lys Gly Val Ala Gln Asn Leu Asn Asn Arg Ile Asp Asn Val Asp Gly 450 455 460		
Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala Thr Ala Gly Leu Val 465 470 475 480		
Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala Ile Gly Gly Gly Thr 485 490 495		
Tyr Arg Gly Glu Ala Gly Tyr Ala Ile Gly Tyr Ser Ser Ile Ser Asp 500 505 510		
Gly Gly Asn Trp Ile Ile Lys Gly Thr Ala Ser Gly Asn Ser Arg Gly 515 520 525		
His Phe Gly Ala Ser Ala Ser Val Gly Tyr Gln Trp 530 535 540		

<210> 34  
 <211> 541  
 <212> PRT  
 <213> Neisseria meningitidis

<400> 34

Thr Asp Glu Asp Glu Glu Glu Glu Leu Glu Ser Val Gln Arg Ser Val  
1 5 10 15

Val Gly Ser Ile Gln Ala Ser Met Glu Gly Ser Val Glu Leu Glu Thr  
20 25 30

Ile Ser Leu Ser Met Thr Asn Asp Ser Lys Glu Phe Val Asp Pro Tyr  
35 40 45

Ile Val Val Thr Leu Lys Ala Gly Asp Asn Leu Lys Ile Lys Gln Asn  
50 55 60

Thr Asn Glu Asn Thr Asn Ala Ser Ser Phe Thr Tyr Ser Leu Lys Lys  
65 70 75 80

Asp Leu Thr Gly Leu Ile Asn Val Glu Thr Glu Lys Leu Ser Phe Gly  
85 90 95

Ala Asn Gly Lys Lys Val Asn Ile Ile Ser Asp Thr Lys Gly Leu Asn  
100 105 110

Phe Ala Lys Glu Thr Ala Gly Thr Asn Gly Asp Thr Thr Val His Leu  
115 120 125

Asn Gly Ile Gly Ser Thr Leu Thr Asp Met Leu Leu Asn Thr Gly Ala  
130 135 140

Thr Thr Asn Val Thr Asn Asp Asn Val Thr Asp Asp Glu Lys Lys Arg  
145 150 155 160

Ala Ala Ser Val Lys Asp Val Leu Asn Ala Gly Trp Asn Ile Lys Gly  
165 170 175

Val Lys Pro Gly Thr Thr Ala Ser Asp Asn Val Asp Phe Val Arg Thr  
180 185 190

Tyr Asp Thr Val Glu Phe Leu Ser Ala Asp Thr Lys Thr Thr Thr Val  
195 200 205

Asn Val Glu Ser Lys Asp Asn Gly Lys Lys Thr Glu Val Lys Ile Gly  
210 215 220

Ala Lys Thr Ser Val Ile Lys Glu Lys Asp Gly Lys Leu Val Thr Gly  
225 230 235 240

Lys Gly Lys Gly Glu Asn Gly Ser Ser Thr Asp Glu Gly Glu Gly Leu  
245 250 255

Val Thr Ala Lys Glu Val Ile Asp Ala Val Asn Lys Ala Gly Trp Arg  
260 265 270

Met Lys Thr Thr Thr Ala Asn Gly Gln Thr Gly Gln Ala Asp Lys Phe  
275 280 285

Glu Thr Val Thr Ser Gly Thr Lys Val Thr Phe Ala Ser Gly Asn Gly  
 290 295 300

Thr Thr Ala Thr Val Ser Lys Asp Asp Gln Gly Asn Ile Thr Val Lys  
 305 310 315 320

Tyr Asp Val Asn Val Gly Asp Ala Leu Asn Val Asn Gln Leu Gln Asn  
 325 330 335

Ser Gly Trp Asn Leu Asp Ser Lys Ala Val Ala Gly Ser Ser Gly Lys  
 340 345 350

Val Ile Ser Gly Asn Val Ser Pro Ser Lys Gly Lys Met Asp Glu Thr  
 355 360 365

Val Asn Ile Asn Ala Gly Asn Asn Ile Glu Ile Thr Arg Asn Gly Lys  
 370 375 380

Asn Ile Asp Ile Ala Thr Ser Met Thr Pro Gln Phe Ser Ser Val Ser  
 385 390 395 400

Leu Gly Ala Gly Ala Asp Ala Pro Thr Leu Ser Val Asp Asp Glu Gly  
 405 410 415

Ala Leu Asn Val Gly Ser Lys Asp Ala Asn Lys Pro Val Arg Ile Thr  
 420 425 430

Asn Val Ala Pro Gly Val Lys Glu Gly Asp Val Thr Asn Val Ala Gln  
 435 440 445

Leu Lys Gly Val Ala Gln Asn Leu Asn Asn Arg Ile Asp Asn Val Asn  
 450 455 460

Gly Asn Ala Arg Ala Gly Ile Ala Gln Ala Ile Ala Thr Ala Gly Leu  
 465 470 475 480

Val Gln Ala Tyr Leu Pro Gly Lys Ser Met Met Ala Ile Gly Gly Gly  
 485 490 495

Thr Tyr Leu Gly Glu Ala Gly Tyr Ala Ile Gly Tyr Ser Ser Ile Ser  
 500 505 510

Ala Gly Gly Asn Trp Ile Ile Lys Gly Thr Ala Ser Gly Asn Ser Arg  
 515 520 525

Gly His Phe Gly Ala Ser Ala Ser Val Gly Tyr Gln Trp  
 530 535 540

<210> 35  
 <211> 461  
 <212> PRT  
 <213> Neisseria meningitidis

<400> 35

Asn Asn Glu Thr Asp Leu Thr Ser Val Gly Thr Glu Lys Leu Ser Phe  
 1 5 10 15

Ser	Ala	Asn	Gly	Asn	Lys	Val	Asn	Ile	Thr	Ser	Asp	Thr	Lys	Gly	Leu	
			20					25					30			
Asn	Phe	Ala	Lys	Glu	Thr	Ala	Gly	Thr	Asn	Gly	Asp	Thr	Thr	Val	His	
		35					40					45				
Leu	Asn	Gly	Ile	Gly	Ser	Thr	Leu	Thr	Asp	Thr	Leu	Leu	Asn	Thr	Gly	
		50				55					60					
Ala	Thr	Thr	Asn	Val	Thr	Asn	Asp	Asn	Val	Thr	Asp	Asp	Glu	Lys	Lys	
					70					75					80	
Arg	Ala	Ala	Ser	Val	Lys	Asp	Val	Leu	Asn	Ala	Gly	Trp	Asn	Ile	Lys	
				85				90						95		
Gly	Val	Lys	Pro	Gly	Thr	Thr	Ala	Ser	Asp	Asn	Val	Asp	Phe	Val	Arg	
			100					105					110			
Thr	Tyr	Asp	Thr	Val	Glu	Phe	Leu	Ser	Ala	Asp	Thr	Lys	Thr	Thr	Thr	
		115					120					125				
Val	Asn	Val	Glu	Ser	Lys	Asp	Asn	Gly	Lys	Lys	Thr	Glu	Val	Lys	Ile	
		130				135						140				
Gly	Ala	Lys	Thr	Ser	Val	Ile	Lys	Glu	Lys	Asp	Gly	Lys	Leu	Val	Thr	
					150					155					160	
Gly	Lys	Asp	Lys	Gly	Glu	Asn	Gly	Ser	Ser	Thr	Asp	Glu	Gly	Glu	Gly	
				165					170					175		
Leu	Val	Thr	Ala	Lys	Glu	Val	Ile	Asp	Ala	Val	Asn	Lys	Ala	Gly	Trp	
			180					185					190			
Arg	Met	Lys	Thr	Thr	Thr	Ala	Asn	Gly	Gln	Thr	Gly	Gln	Ala	Asp	Lys	
		195					200					205				
Phe	Glu	Thr	Val	Thr	Ser	Gly	Thr	Asn	Val	Thr	Phe	Ala	Ser	Gly	Lys	
		210				215					220					
Gly	Thr	Thr	Ala	Thr	Val	Ser	Lys	Asp	Asp	Gln	Gly	Asn	Ile	Thr	Val	
					230					235					240	
Met	Tyr	Asp	Val	Asn	Val	Gly	Asp	Ala	Leu	Asn	Val	Asn	Gln	Leu	Gln	
				245					250					255		
Asn	Ser	Gly	Trp	Asn	Leu	Asp	Ser	Lys	Ala	Val	Ala	Gly	Ser	Ser	Gly	
			260					265					270			
Lys	Val	Ile	Ser	Gly	Asn	Val	Ser	Pro	Ser	Lys	Gly	Lys	Met	Asp	Glu	
		275					280					285				
Thr	Val	Asn	Ile	Asn	Ala	Gly	Asn	Asn	Ile	Glu	Ile	Thr	Arg	Asn	Gly	
		290				295					300					
Lys	Asn	Ile	Asp	Ile	Ala	Thr	Ser	Met	Thr	Pro	Gln	Phe	Ser	Ser	Val	
					310					315					320	







420	425	430
Ser Ala Gly Gly Asn Trp Ile Ile Lys Gly Thr Ala Ser Gly Asn Ser		
435	440	445
Arg Gly His Phe Gly Ala Ser Ala Ser Val Gly Tyr Gln Trp		
450	455	460
<210> 37		
<211> 356		
<212> PRT		
<213> Neisseria meningitidis		
<400> 37		
Asn Asn Val Asp Phe Val Arg Thr Tyr Asp Thr Val Glu Phe Leu Ser		
1	5	10
Ala Asp Thr Lys Thr Thr Thr Val Asn Val Glu Ser Lys Asp Asn Gly		
20	25	30
Lys Lys Thr Glu Val Lys Ile Gly Ala Lys Thr Ser Val Ile Lys Glu		
35	40	45
Lys Asp Gly Lys Leu Val Thr Gly Lys Asp Lys Gly Glu Asn Gly Ser		
50	55	60
Ser Thr Asp Glu Gly Glu Gly Leu Val Thr Ala Lys Glu Val Ile Asp		
65	70	75
Ala Val Asn Lys Ala Gly Trp Arg Met Lys Thr Thr Thr Ala Asn Gly		
85	90	95
Gln Thr Gly Gln Ala Asp Lys Phe Glu Thr Val Thr Ser Gly Thr Asn		
100	105	110
Val Thr Phe Ala Ser Gly Lys Gly Thr Thr Ala Thr Val Ser Lys Asp		
115	120	125
Asp Gln Gly Asn Ile Thr Val Met Tyr Asp Val Asn Val Gly Asp Ala		
130	135	140
Leu Asn Val Asn Gln Leu Gln Asn Ser Gly Trp Asn Leu Asp Ser Lys		
145	150	155
Ala Val Ala Gly Ser Ser Gly Lys Val Ile Ser Gly Asn Val Ser Pro		
165	170	175
Ser Lys Gly Lys Met Asp Glu Thr Val Asn Ile Asn Ala Gly Asn Asn		
180	185	190
Ile Glu Ile Thr Arg Asn Gly Lys Asn Ile Asp Ile Ala Thr Ser Met		
195	200	205
Thr Pro Gln Phe Ser Ser Val Ser Leu Gly Ala Gly Ala Asp Ala Pro		
210	215	220







<211> 30  
 <212> DNA  
 <213> Neisseria meningitidis

<400> 42  
 ggtcagatct gtttcattgt tagcacttgc 30

<210> 43  
 <211> 30  
 <212> DNA  
 <213> Neisseria meningitidis

<400> 43  
 gatcaggcct gtatcttcat cggtagcatt 30

<210> 44  
 <211> 39  
 <212> DNA  
 <213> Neisseria meningitidis

<400> 44  
 gacgaaatca acgttcttag cacttgctg aaccgttgc 39

<210> 45  
 <211> 24  
 <212> DNA  
 <213> Neisseria meningitidis

<400> 45  
 aacgttgatt tcgtccgcac ttac 24

<210> 46  
 <211> 39  
 <212> DNA  
 <213> Neisseria meningitidis

<400> 46  
 aacgcttgcc gcacgcttag cacttgctg caacgttgc 39

<210> 47  
 <211> 24  
 <212> DNA  
 <213> Neisseria meningitidis

<400> 47  
 cgtgcgga gcgtaaaga cgta 24

<210> 48  
 <211> 72  
 <212> DNA  
 <213> Neisseria meningitidis

<400> 48  
cagcgagtag gtgaattggt tgattttcag gttgtcgccg gctttgaggg tgtagcact 60  
tgcctgaacc gt 72

<210> 49  
<211> 24  
<212> DNA  
<213> Neisseria meningitidis

<400> 49  
ttcacctact cgctgaaaaa agac 24

<210> 50  
<211> 57  
<212> DNA  
<213> Neisseria meningitidis

<400> 50  
gccagcggtt aatacgtctt taacgcttgc cgcacgatcg gtcaaagtcg aaccaat 57

<210> 51  
<211> 57  
<212> DNA  
<213> Neisseria meningitidis

<400> 51  
gtattaaacg ctggctggaa cattaaaggc gttaaaaacg ttgatttcgt ccgcact 57

<210> 52  
<211> 11  
<212> PRT  
<213> Neisseria meningitidis

<220>  
<221> misc\_feature  
<223> "X" is any amino acid or absent amino acid

<400> 52

Xaa Xaa Glu Thr Asp Leu Thr Ser Val Gly Thr  
1 5 10